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(54) Abstract Title

Warm water windscreen washing device

(57) A windscreen washing device is arranged such that warm water is delivered from a reservoir 2 via a flexible, plastics tube 8 which has its distal end 16 attached to a windscreen wiper assembly of the automobile. Preferably the reservoir 2 is situated in and removable from the passenger compartment of the automobile. The heater is preferably electric and both the heater and pump 6 are preferably powered by the automobile's own electrical system. A plug 10 to connect the pump 6 to a cigarette lighter socket may be provided. As the cleaning water is delivered directly to the wiper assembly the delivery tube 8 need not have a nozzle and may have an enlarged bore making it less likely to become blocked.

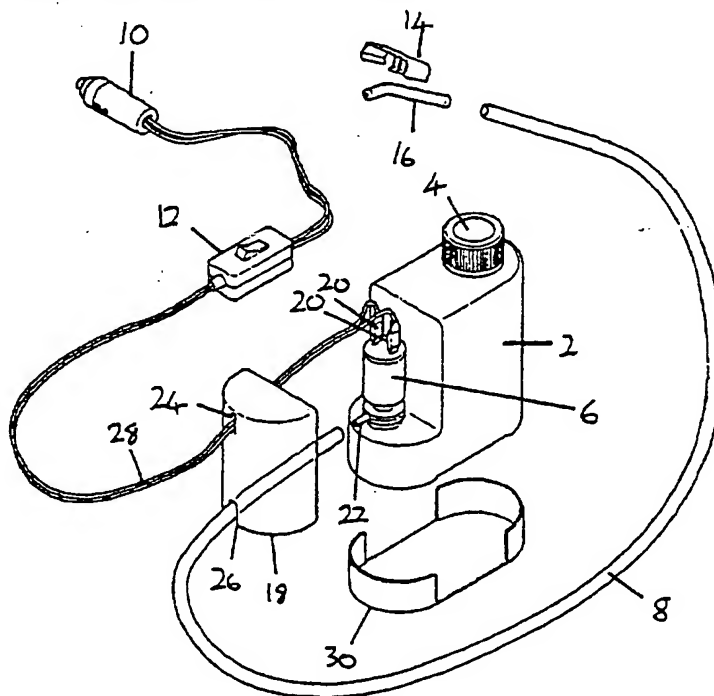


Figure 1

Automobile Windscreen Washing Arrangement

The present invention relates to an automobile windscreen washing arrangement.

Virtually all present day automobiles have a windscreen washing arrangement in which cleaning water, sometimes  
5 containing a chemical cleaning agent, is sprayed from one or more nozzles onto the automobile's windscreen. The cleaning water, together with any dirt, is then swept from the windscreen by one or more reciprocating wiper blades.

Unfortunately, whilst such arrangements are generally  
10 very effective, they do suffer a number of significant drawbacks. Firstly, the nozzles through which cleaning water is sprayed onto the windscreen are necessarily formed with a very small exit hole which is easily blocked by dirt. Secondly, the cleaning water reservoir is situated outside the  
15 passenger compartment of the automobile so that in very cold climates, such as those found in Northern Europe, the cleaning water is prone to freezing, either in its reservoir, in its delivery pipe, or upon contact with the windscreen.

I have now devised an arrangement which overcomes the  
20 above-mentioned limitations of existing automobile windscreen washing arrangements.

In accordance with the present invention, there is provided an automobile windscreen washing arrangement comprising an electric pump arranged to deliver warm cleaning  
25 water from a reservoir to the automobile windscreen via a flexible, plastics tube which, in use, is attached at its distal end to a windscreen wiper assembly of the automobile.

The reservoir is preferably situated within the automobile passenger compartment, so that the cleaning water  
30 within the reservoir will be kept warm. In particularly cold conditions, the reservoir of cleaning water may be kept indoors and then installed within the vehicle when commencing a journey.

It will be appreciated that the warm cleaning water is  
35 far less likely to freeze within its reservoir, its delivery pipe, or upon contact with the windscreen. Also, as the

cleaning water is delivered directed at the wiper assembly, no spray nozzle is required. The delivery tube, having an enlarged bore, is therefore far less likely to become blocked by dirt.

5        Preferably the pump is powered by the automobile's own electrical system. Preferably the pump is provided with a plug for connecting to the automobile's cigarette lighter socket. The windscreen washing arrangement may therefore be supplied as a retro-fit assembly, suitable for attachment to any vehicle  
10 as required.

      Whilst it may not always be necessary to raise the temperature of the cleaning water above that of the passenger compartment within which it is situated, the windscreen washing arrangement is preferably provided with an electric water  
15 heater, which is preferably powered by the automobile's own electrical system.

      An embodiment of the present invention will now be described by way of an example only and with reference to the accompanying drawings, in which:

20        Figure 1 shows an exploded, perspective view of an automobile windscreen washing arrangement in accordance with the present invention; and

      Figure 2 shows the reservoir and pump of the arrangement of Figure 1, when assembled for use.

25        Referring to the drawings, an automobile windscreen washer arrangement is shown comprising a refillable reservoir 2, closed by a cap 4, and provided with a pump 6 for pumping the reservoir contents through a delivery pipe 8.

      The pump 6 is electrically operated and is connected to  
30 the automobile's own electrical system by means of a plug 10 which is arranged to fit into the automobile's cigarette lighter socket. A switch 12 allows the pump to be turned on or off.

      The delivery pipe 8 is provided with a clip 14 for  
35 attaching a removable tip 16 of the pipe to a windscreen wiper arm of the automobile. The removable tip 16 is formed with a bend allowing it to be adjusted to direct a flow of cleaning water onto the windscreen.

      A detachable cover 18 allows access to the electrical

terminals 20 of the pump and to its water outlet 22, and is formed with respective passages 24,26 through which the electrical cable 28 and water pipe 8 are passed.

As shown in Figure 2, a detachable base portion 30 of the reservoir and pump assembly may be rotated through ninety degrees to form a stand to increase the lateral stability of the assembly.

Whilst not shown in the drawings, the reservoir 2 may comprise an electric heater for heating the cleaning water prior to its delivery.

In use, the washer arrangement is placed inside the passenger compartment of an automobile and is connected, via a cigarette lighter socket, to the automobile's electrical supply. The cleaning water delivery pipe 8 is passed out of the passenger compartment between the door assembly and its supporting frame, and is attached to the windscreen wiper arm by means of the clip 14. The pipe 8 is formed of a flexible, plastics material which is sufficiently robust to withstand being constricted by the resilient seal which extends around the door, the seal itself deforming to accommodate the pipe.

When the windscreen is to be washed, the switch 12 is operated, causing heated cleaning water to flow through the pipe 8 and onto the windscreen.

The automobile windscreen washer apparatus thus described provides an alternative means for delivering cleaning water to the windscreen of an automobile, the apparatus being far less susceptible to blockages, and substantially more immune to cold weather effects than existing arrangements.

Claims

- 1) An automobile windscreen washing arrangement comprising an electric pump arranged to deliver warm cleaning water from a reservoir to the automobile windscreen via a flexible,  
5 plastics tube which, in use, is attached at its distal end to a windscreen wiper assembly of the automobile.
- 2) An automobile windscreen washing arrangement as claimed in Claim 1, wherein said reservoir is situated within the automobile passenger compartment.
- 10 3) An automobile windscreen washing arrangement as claimed in Claim 2, wherein said reservoir is removable from said automobile passenger compartment.
- 4) An automobile windscreen washing arrangement as claimed in any preceding claim, wherein said pump is powered by the  
15 automobile's own electrical system.
- 5) An automobile windscreen washing arrangement as claimed in Claim 4, wherein said pump is provided with a plug for connecting to the automobile's cigarette lighter socket.
- 6) An automobile windscreen washing arrangement as claimed  
20 in any preceding claim, comprising an electric water heater.
- 7) An automobile windscreen washing arrangement as claimed in Claim 6, wherein said electric water heater is powered by the automobile's own electrical system.
- 8) An automobile windscreen washing arrangement  
25 substantially as herein described with reference to the accompanying drawings.

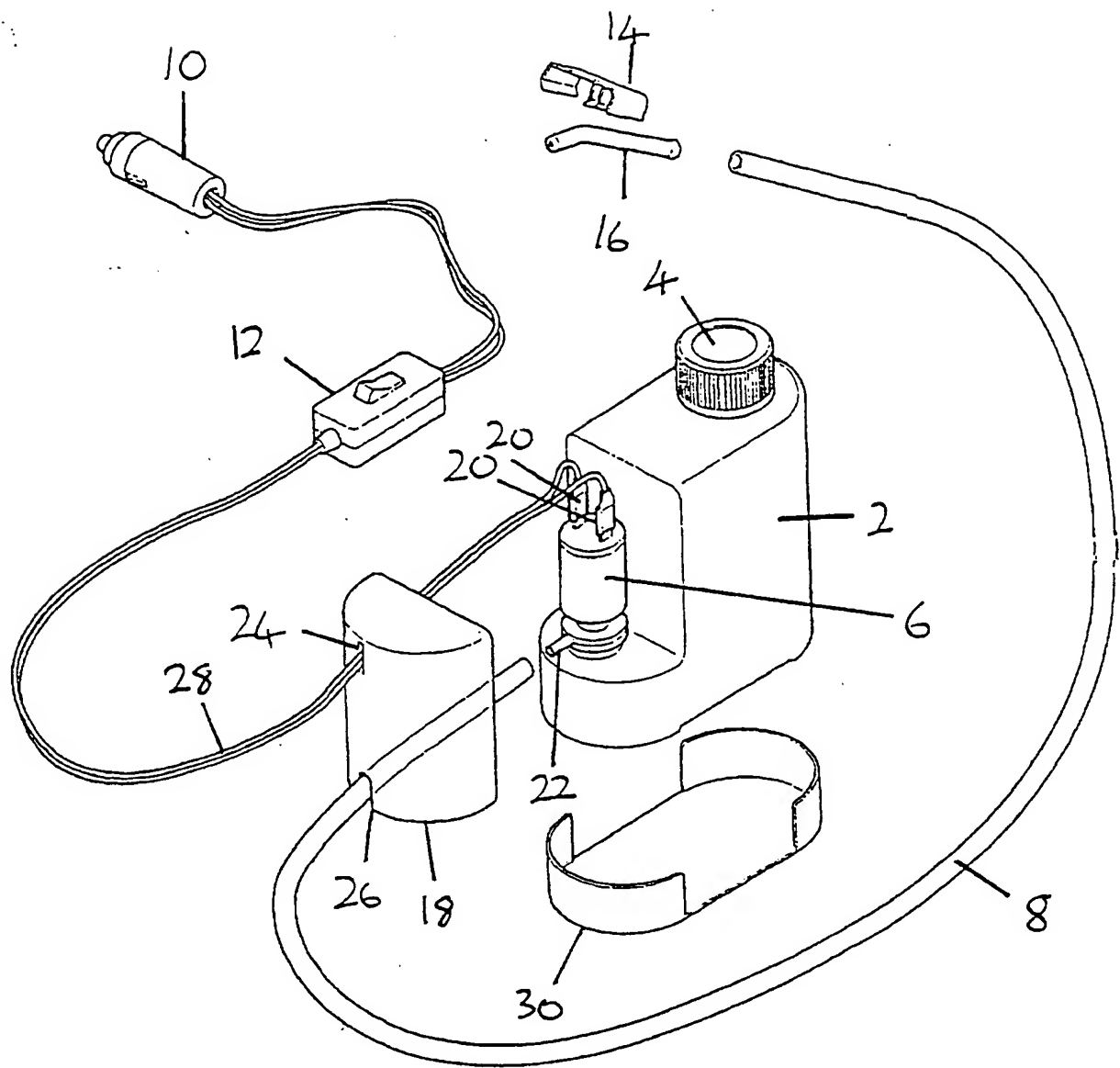


Figure 1

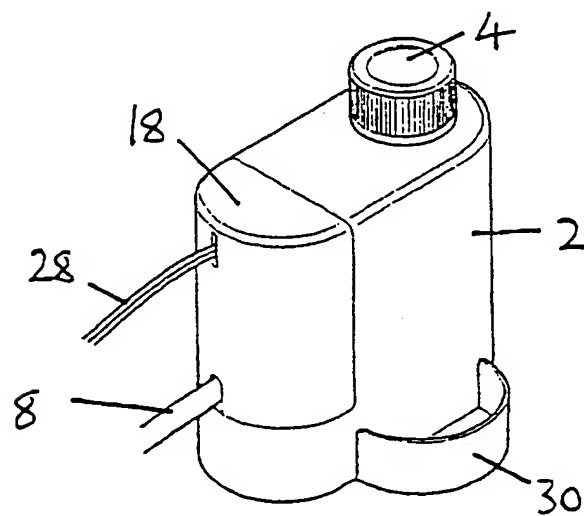


Figure 2